Remarks/Arguments

Applicants request reconsideration of the application in view of the above amendments and the following remarks.

Status of Claims

Claims 1-14, 16, 17, 19, 20 and 41-49 stand rejected. Claims 1, 7, 10, 13, 42, and 44-46 are amended to provide further clarification. Claims 15, 18, 21-41 and 47-49 have been canceled without prejudice. New claims 52- 58 are added.

Amendments

Independent claim 1 has been amended to recite "determining a target energy density for said substrate" and "wherein said astigmatic focal beam spot is modified and focused to provide an energy density on said substrate at the target energy density for said substrate." Support for this amendment may be found, for example, in the Abstract and in paragraphs 0046, 0061, and 0064-0066 of the present specification. Dependent claims 7, 10, 13, 42, and 44-46 have been amended to be consistent with independent claim 1. New claims 52-58 are added to define the method further. Support for these new claims may be found, for example, in the Abstract and in paragraphs 0039, 0040, 0042, 0043, 0046, 0061, and 0064-0066.

Rejections under 35 U.S.C. §103

Claims 1, 5, 7-10, 16-17, 19-20 and 44 are rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Pat. No. 4,752,922 to MacAnally, et al. ("MacAnally") in view of U.S. Pat. No. 6,266,302 to Yamanaka ("Yamanaka"). Claims 2-4, 11-12 and 46-47 are rejected under 35 U.S.C. §103(a) over MacAnally in view of Yamanaka and further in view of U.S. Patent No. 6,580,054 to Liu et al. ("Liu"). Claims 6 and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over MacAnally and Yamanaka and further in view of U.S. Pat. No. 5,181,224 to Snyder ("Snyder"). Claims 13-14, 41-43 and 48-49 are rejected under 35 U.S.C. §103(a) as being unpatentable over MacAnally and Yamanaka and further in view of U.S. Pat. No. 6,881,529 to Iwasaki ("Iwasaki"). Applicants respectfully traverse these rejections.

Applicants again submit that the Office Action fails to establish a *prima facie* case of obviousness for the reasons stated in the previous replies dated January 18, 2006 and January 5, 2007, which are incorporated herein by reference. In particular, the Office Action again fails to identify any disclosure in MacAnally or Yamanaka of the use of an astigmatic focal beam spot to cause ablation of a substrate. In the Response to Arguments section, the Office Action states "the references are drawn to the laser ablation of an optical storage material." Although ablation may be one way in which pits are formed in the recording layer of an optical disc, applicants are unable to find any disclosure in MacAnally or Yamanka to support the assertion that ablation is performed by the methods disclosed in these references. Applicants respectfully point out that ablation is not the only technique for recording on an optical disc. In fact, Yamanaka states that "[a]n optical disk apparatus records information on an reproduces recorded information from grooves and/or lands formed in an optical recording medium by utilizing optical magnetism or phase change" (see Yamanaka, col. 1, lines 9-12). Optical magnetism and phase change are different than ablation.

Moreover, the Office Action has erred by asserting that MacAnally uses an astigmatic beam to ablate a substrate. Even if the Office Action had properly established that MacAnally and Yamanaka disclose ablation, MacAnally explicitly states"[p]rior to writing data, the write beam 58 must be collimated, de-astigmatized and given a circular cross section" (see MacAnally, col. 12, lines 23-25). Thus, if MacAnally were to disclose or suggest ablation as a technique for writing to an optical disc, MacAnally expressly teaches away from using an astigmatic beam to cause that ablation. When addressing this argument in the Response to Arguments section, the Office Action merely states "[t]he examiner respectfully disagrees because MacAnally discloses reading and writing of an optical disk." MacAnally does disclose reading and writing an optical disk but does not disclose the use of an astigmatic focal beam spot to cause ablation.

Furthermore, the Office Action has failed to explain how MacAnally or Yamanaka disclose "moving said substrate in a cutting direction along said length of said astigmatic focal beam spot," as recited in claim 1. Even if MacAnally or Yamanaka disclosed ablation, the rotating optical disc would not be moving in a cutting direction along the length of the astigmatic focal beam spot.

Applicants further submit that the Office Action fails to provide any explanation as to how some of the other claimed limitations are disclosed or would have been obvious. In particular, the Office Action fails to explain how MacAnally and Yamanaka disclose or make obvious the claimed characteristics of the astigmatic focal beam spot, namely, "said astigmatic focal beam spot having an elongated shape with a focused axis having a first focal point and an astigmatic axis having a second focal point separate from said first focal point, said astigmatic focal beam spot having a length along said astigmatic axis and a width along said focused axis, the width being less than the length." The Office Action also fails to address, *inter alia*, varying the convergence (claim 7), symmetrically cropping low intensity edges (claim 9), or creating a plurality of separated astigmatic beamlets (claim 19).

For these reasons, applicants submit that independent claim 1, and the claims dependent therefrom, would not have been obvious over the combination of references proposed in the Office Action. Accordingly, applicants request that the rejections under 35 U.S.C. §103 be withdrawn.

Applicants further submit that independent claim 1, as amended, even further defines over the art of record. In particular, claim 1 has been amended to recite "determining a target energy density for said substrate" and "wherein said astigmatic focal beam spot is modified and focused to provide an energy density on said substrate at the target energy density for said substrate." The claimed method thus facilitates optimization of the processing parameters such as energy density, for example, as described in paragraphs 0058 and 0061-0063 of the present application. In particular, the claimed method of forming an astigmatic beam spot to ablate and cut a substrate, such as sapphire, may prevent an overflow of laser energy density that can cause thermal damage and may prevent a lack of energy density that can cause improper ablation. The optimum energy density may be achieved while also enabling faster scribing speeds by increasing the length of the focused beam (see, e.g., paragraph 0057 of the present specification) and while enabling a minimized spot size in the focused axis to reduce the scribing kerf width (see, e.g., as described in paragraph 0064 of the present application).

New claim 52 similarly recites a method of cutting a substrate comprising, *inter alia*, determining a target energy density for the substrate and adjusting the variable anamorphic lens system to vary an aspect ratio of the astigmatic focal beam spot such that the energy density of

the astigmatic focal beam spot is provided at the target energy density for the substrate. A variable astigmatic focal beam spot advantageously allows adjustment of the energy density at the target without affecting laser output power (see present specification, Abstract). In other words, the variable astigmatic beam spot may be adjusted to reduce an energy density to an optimum energy density for a particular substrate without reducing the power output from the laser (see present specification, paragraph 0065). The present specification, in paragraphs 0065 and 0066, specifically describes examples of how a variable astigmatic beam spot may be adjusted to provide an optimum laser energy density for a sapphire substrate and for a sapphire substrate with a GaN layer.

For these additional reasons, applicants submit that the method recited in amended independent claim 1 and in new independent claim 52, and the claims dependent therefrom, would not have been obvious to one of ordinary skill in the art.

Conclusion

The examiner is invited to telephone the undersigned, applicant's attorney of record, to facilitate advancement of the present application.

Please apply any charges not covered, or any credits, to Deposit Account 50-2121 (Reference Number JPSA001).

Respectfully submitted,

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